UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *17 March 2008*.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-7,9-21 and 23-28* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-7,9-21 and 23-28* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *14 November 2003* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-7, 9-21 and 23-28 are pending.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-3, 6-7, 9-10, 13-17, 20-21, 23-24, 27 and 28 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Wilkinson et al.(Wilkinson) US Patent no. 6,094,715, in view of

Kubo(Kubo) US Patent No. 5,881,284.

4.   As per claim 1, Wilkinson teaches the invention as claimed including an apparatus for

executing at least one single multiple data(SPMD) program in a microprocessor, said apparatus

comprising:

        a micro single instruction multiple data (SIMD) unit located within said microprocessor

(col 7 lines 25-27); and

        a job buffer having an output coupled to an input of said micro SIMD unit, wherein said

job buffer based on a control flow equivalence of said jobs and allocates said task to said micro

SIMD unit (col 24, lines 53-55; col 26, lines 29-34; col 27, lines 24-34; col 29, lines 52-60).

        Wilkinson does not specifically disclose dynamically bundling jobs into a task.

5.   However, Kubo teaches dynamically bundling jobs into a task (col 1, lines 56-59).

6.   Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Kubo into method of Wilkinson bundle the jobs into a task with different control flow. The modification would have been obvious because one of the ordinary skills of the art would have the job bundled with same control flow of data together to be able to execute the jobs without switching different control mode and save system resources and execution time.

7.   As per claim 2, Wilkinson teaches said micro SIMD unit is capable of sending job status information to said job buffer (col 73, lines 1-4; col 48, lines 28-30).

8.   As per claim 3, Wilkinson teaches said at least one SPMD program comprises a plurality of input data streams having moderate diversification of control flows (col 8, lines 25-29).

9.   As per claim 6, Wilkinson teaches said apparatus executes a plurality of SPMD programs and wherein each SPMD program of said plurality of SPMD programs is executed on a number of input data streams (col 8 lines 19-2).

10.   As per claim 7, Wilkinson teaches said number of input data streams is greater than a program granularity threshold (col 41 lines 24-36).

11.   As per claim 9, Kubo teaches said apparatus performs job clustering to form a job bundle

in which each job in said job bundle has an equivalent control flow (col 1, lines 34-36),

12.   As per claim 10, Wilkinson teaches said apparatus performs said job clustering based on

a job processing status of said jobs in said job bundle (col 21 lines 9-11).

13.   As per claim 13, Kubo teaches said apparatus maximizes a size of a job cluster by

selecting tasks for execution in which a job processing status of each of said tasks is complete

(col 5 lines 32-39).

14.   As per claim 14, Kubo teaches said apparatus executes a data loading phase for a task

before said apparatus executes a task execution phase for said task (col 3 lines 54-63)

15.   Claims 15-17, 20 and 21 are system claims of claims 1-3, 6 and 7 above. They are

therefore rejected under the same rational.

16.   As per claims 23, 24, 27 and 28, they have similar limitations as of claims 9, 10, 13 and

14 above. Therefore, they are therefore rejected under the same rational of claims 9, 10, 13 and

14 above.

17.   Claims 4, 5, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Wilkinson et al.(Wilkinson) US Patent no. 6,094,715, , in view of Kubo(Kubo) US Patent No.

5,881,284 and in view of Pechanek et al. US Patent No. 6,470,441 B1.

18.   As per claim 4, Wilkinson does not specifically discloses apparatus executes said at least

one SPMD program once for each input data stream of said plurality of input data streams.

19.   However, Pechanek teaches said apparatus executes said at least one SPMD program

once for each input data stream of said plurality of input data streams (col 4 lines 62-65).

20.   It would have been obvious to a person of ordinary skill in art at the time of invention

was made to incorporate the teaching of Pechanek into combined method of Wilkinson and Kubo

to execute SPMD once for each data stream. The modification would have been obvious because

one of the ordinary skills of the art would have a SPMD program execution once for each data

input stream as it would reduce the latency of process execution.

21.   As per claim 5, Wilkinson teaches said apparatus generates an instruction stream for each

input data stream of said plurality of input data streams (col 8 lines 25-28).

22.   As per claims 18 and 19, they have similar limitations as of claims 4 and 5 above.

Therefore, they are therefore rejected under the same rational of claims 4 and 5 above.

23.   Claims 11, 12, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Wilkinson et al.(Wilkinson) US Patent no. 6,094,715 in view of Kubo(Kubo) US Patent No.

5,881,284, and further in view of "Multi-thread VLIW processor architecture for HDTV

decoding" by Hansoo Kim(Kim).

24.   As per claim 11, Wilkinson and Kubo do not specifically disclose forces a task to

terminate at a point where a job control path might fork by placing a code-stop.

25.   However, Kim teaches said apparatus forces a task to terminate at a point where a job

control path might fork by placing a code-stop in said task (page 3, col 1, lines 3-8, "the program

can ………… entries exceeds a predefined number.")

26.   Therefore, it would have been obvious to a person of ordinary skill in art at the time of

invention was made to incorporate the teaching of Kim into the combined method of Wilkinson

and Kubo to have a task termination point to switch task. The modification would have been

obvious because one of the ordinary skills of the art would have a task switch to fulfill special

conditions of system execution and prioritize execution.

27.   As per claim 12, Kim teaches said apparatus minimizes a required number of code-stops

to be placed in said task by excluding from code-stop placement each control flow statements

that is equivalent to a select instruction (page 3 col 1 lines 3-8, "the program can ………..

exceeds a predefined number.").

28.   As per claims 25 and 26, they have similar limitations as of claims 11 and 12 above.

Therefore, they are therefore rejected under the same rational of claims 11 and 12 above.

Response to Argument

29.   Applicant's arguments filed 03/17/2008 have been fully considered but they are not

persuasive.

30.   In the remarks applicant argues that:

(1) Dynamically scheduling batch jobs in Kubo does not read on dynamically bundling

jobs based on control flow equivalence.

31.   Examiner respectfully disagree to applicant:

i.   as to points (1), applicant support his argument with mentioning the job being

bundled based on control flow equivalence. The claim limitation is not specific enough to

clarify what is defined by control flow equivalence and how the job is being bundled

based on that and also does not define if the job is not equivalent to control flow.

Examiner interprets the limitation as bundling job execution in different operational

mode with different word length. The rejection is for 103 rejections, Wilkinson teaches

having different control flow of job in different mode(col 24, lines 53-55; col 26, lines

29-34; col 27, lines 24-34; col 29, lines 52-60) and Kubo teaches dynamically bundling

the jobs(col 1, lines 56-59). Therefore, it would have been obvious to a person of

ordinary skill in art at the time of invention was made to incorporate the teaching of Kubo

into method of Wilkinson bundle the jobs into a task with different control flow. The

modification would have been obvious because one of the ordinary skills of the art would

have the job bundled with same control flow of data together to be able to execute the

jobs without switching different control mode and save system resources and execution

time (see paragraph 7 above). Wilkenson further teaches the instructions are fed into the

PME from the BCI which buffers each broadcast data word until all of its PMEs have

used it (col. 24). This synchronization provides accommodation of the data time

dependencies associated with the execution of SIMD commands and allows

asynchronous operations to be performed by a PME. The data time dependencies

associated with the instructions / commands is also a control flow equivalence.

Conclusion

32.   Applicant's amendment filed November 13, 2007, necessitated the new ground(s) of

rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See

MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

33.   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

34.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Abdullah-Al Kawsar whose telephone number is 571-270-3169.

The examiner can normally be reached on 7:30am to 5:00pm, EST.

35.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng Ai T. An can be reached on 571-272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

36.   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abdullah-Al Kawsar
Patent Examiner
ART Unit 2195.

/Lewis A. Bullock, Jr./
Supervisory Patent Examiner, Art Unit 2193